1. Project title: Electrosense
2. Names and email addresses of team members (CSE members first--this is a plan for the CSE contribution)

   Marko Vukasinovic: mvukasinovic2019@my.fit.edu

   Katie Canedo: kcanedo2020@my.fit.edu

   Alexis Haley: ahaley2019@my.fit.edu

   Aveisha Maharaj: amaharaj2019@my.fit.edu

   Kayla Mastin: kmastin2019@my.fit.edu

3. Faculty advisor: Dr. Venkat Keshav Chivukula
4. Client: Venkat Keshav Chivukula, ICU patients and hospitals across the US
5. Date(s) of Meeting(s) with the Client for developing this Plan: Tuesdays and Thursdays
6. Goal and motivation: Discuss the overall goal (help make the intended users "happier") and motivation (why are the intended users not too "happy"? limitations/pains of current systems) happier"?)

   The goal of our project is to create a hospital mattress designed for ICU patients that incorporates sensors within. This would help healthcare workers know when something is wrong with their patient which would help make sure the ICU patients are safe and comfortable.

7. Approach (key features of the system): Discuss at least three key features/functionalities that your system provides for the users to help achieve the overall goal.
   (what features does your system have that can help make the happier"?)
   (at least one paragraph for each feature, more specific less vague) [e.g. Similar to app descriptions at Google Play, **NOT** the underlying tools]
   **For interdisciplinary/exteral projects: focus on (identify) separate CSE features/contributions**

   This goes along with an IOS app to connect to the bed via Bluetooth to be able to alert nurses of rapid changes in vitals.

   This will also assist CNAs who are understaffed in collected basic vitals such as heart rate and pulse oximetry as well as preventing bed sores

   Pressure sensors for body pressure mapping which will provide things like weight distribution and sleep analysis throughout the night

   Heart rate and pulse oximetry sensors to provide around the clock updates of basic vitals

Bed alarm sensor to detect when the patient is rapidly moving (which could indicate convulsion activity) or when a patient on bed rest is trying to get up

Temperature sensors that will be adjustable in 3 regions

Circulation compression pumps combined with massager to prevent bed sores and rotate bed bound patients

Each of the aforementioned sensors comes with specific data gathering libraries available which will be used in order to gather acquired data in one place. We will then use a different script to send the collected data over bluetooth, to be received over the phone app

8. Novel features/functionalities: Combination of a vide variety of sensors in order to create a broader picture for the healthcare provider of their patient than ever before.
9. Technical Challenges: Discuss three main CSE-related challenges

   We plan on using SWIFT and XCode for our application without having much experience due to the fact that we plan on testing our product on the iPad.

   Integrating many different sensors together will be difficult as their operating libraries are incompatible and will give results in different intervals, accuracies, etc. Grouping the collected data and cleaning it presents the biggest challenge.

   The team has no experience with facilitating bluetooth communication between two devices which might require further equipment to be integrated.

10. Milestone 1 (Oct 3):
    - Compare and select technical tools for *Developing application, Controlling sensors and gathering their input, Bluetooth communication*
    - Provide small ("hello world") demo(s) to evaluate the tools for *Developing application, Controlling sensors and gathering their input, Bluetooth communication*
    - Resolve technical challenges: *Choosing and implementing multiple sensors, Building basic framework for the application, Decide on transfer of data issue*
    - Compare and select collaboration tools for software development, documents/presentations, communication, task calendar
    - Create Requirement Document
    - Create Design Document
    - Create Test Plan and Datasets
11. Milestone 2 (Oct 31):
    - Implement, test, and demo *Basic App Layout and Data Display*
    - Implement, test, and demo *Bluetooth Communication between Arduino and App*
12. Milestone 3 (Nov 28):
    - Implement, test, and demo *Pressure Sensors*
    - Implement, test, and demo *Heart Rate Sensors*

- Implement, test, and demo *Temperature Sensors*
- Implement, test, and demo *Bed Alarm Sensors*
- Implement, test, and demo *Circulation Pumps*

13. Task matrix for Milestone 1 (Software side members)

| Task | Kayla | Alexis | Marko |
|---|---|---|---|
| Compare and select Technical Tools | Sensor Programming | App Development | Bluetooth Communication |
| "hello world" demos | Sensor Data Gathering | Data Display | BLuetooth Communication, Data Display |
| Resolve Technical Challenges | Implement All Sensor Libraries | *Use XCode and SWIFT for App Development* | Implement Bluetooth Communication and make sure gather data is compatible with app |
| Compare and select Collaboration Tools | programs | documents/presentations | communication, task calendar |
| Requirement Document | write 33% | write 33% | write 33% |
| Design Document | write 33% | write 33% | write 33% |
| Test Plan | write 33% | write 33% | write 33% |

14. Approval from Faculty Advisor
    - "I have discussed with the team and approve this project plan. I will evaluate the progress and assign a grade for each of the three milestones."
    - Signature: _____ Date: _____